

CRITICAL ANALYSIS OF BUILDING WITH VERTICAL IRREGULARITIES AS PER IS1893 Part-1:2002

DHARA SHAH¹ & ANJURISHRIVASTAVA²

¹Assistant Professor, Faculty of Technology, CEPT University, Ahmadabad, Gujarat, India

²Research Scholar, Department of Structural Engineering, CEPT University, Ahmadabad, Gujarat, India

ABSTRACT

Earthquake forces are not only responsible for the loss of economy property and material but possess a huge threat to lives of people as well. In recent past years, serious damages and casualties due to these disastrous forces have been visualized and various lessons have been learned mainly by the designing and construction authorities. In the present study, the effect of vertical irregularity in a building is studied with the help of different analysis methods. Linear elastic analysis, nonlinear static pushover analysis, and linear dynamic response spectrum analysis are applied on structures with one or more vertical irregularity incorporated in it so as to study the individual as well as the combined effect of these irregularities. The incorporated irregularities are as per IS1893 Part-1:2002. The results obtained are discussed under the following headings such as displacement values, mode shapes, modal time period, modal mass participation factor, base shear performance point capacity of structure and hinge formation pattern are compared and studied for various irregularities in structure with and without infill walls. All comparisons are represented graphically and also in tabulated form in terms of percentage variation wherever required.

KEYWORDS: Vertical Irregularities, Performance Point, Capacity of Structure, Modal Mass Participation, Modal Time Period, Mode Shapes, Base Shear & Hinge Formation

Received: May 16, 2018; **Accepted:** Jun 06, 2018; **Published:** Jul 04, 2018; **Paper Id.:** IJCSEIERDAUG20182